

WHAT IS CLAIMED IS:

1. A welding method capable of controlling an arc heat distribution on a groove face of a base metal, which is characterized in that the melting rate of a welding wire is increased or decreased relative to the feeding rate of the welding wire by changing the characteristic of an arc current to thereby change an arc generating position of a fusing end of the welding wire.

2. The welding method as claimed in Claim 1, wherein the amount of an electrical current as the characteristic of the arc current is changed to thereby perform a DC arc welding operation.

3. The welding method as claimed in Claim 1, wherein an AC arc welding operation is performed by changing the polarity of the welding wire as the characteristic of the arc current.

4. The welding method as claimed in Claim 1, wherein an arc welding operation is performed by changing the waveform of an electrical current as the characteristic of the arc current.

5. The welding method as claimed in any one of Claims 1 through 4, wherein a groove welding operation is performed.

6. The welding method as claimed in any one of Claims 1 through 4, wherein a Uranami welding operation is performed.

7. A welded joint structure formed by any one of Claims 1 through 6, wherein the welded joint structure consists of a

high strength steel having a superfine gr in structure with a carbon equivalent of as low as less than 0.38 and a crystal grain size of less than 7  $\mu\text{m}$ .

8. The welded joint structure as claimed in Claim 7, wherein the welded joint structure has an extremely narrow groove of less than 10 mm.

9. The welded joint structure as claimed in Claim 7 or 8, wherein the welded joint structure includes heat affected zone whose hardness is controlled to less than 250 H v.

10. The welded joint structure as claimed in any one of Claims 7 through 9, wherein the welded joint structure is welded in a multiplicity of layers.